

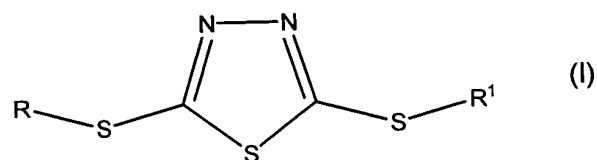
What is claimed is:

1. An antiwear composition for use as an additive for lubricants, comprising:

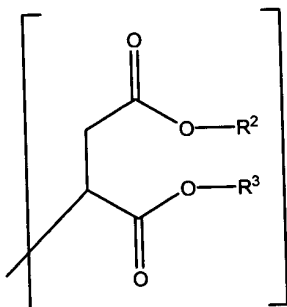
(1) an organo borate ester composition; and

(2) one or more components selected from the group consisting of :

(i) 1,3,4-thiadiazole compounds of the formula (I):

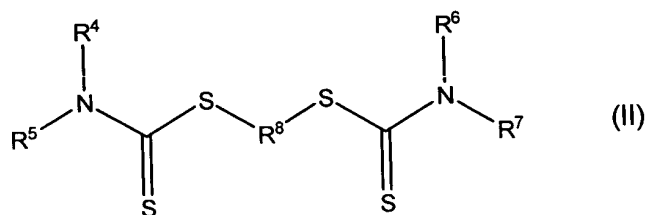


wherein R and R<sup>1</sup> are independently selected from hydrogen and C<sub>8-12</sub> thioalkyl or hydrogen, C<sub>1-22</sub>-alkyl groups, terpene residue and maleic acid residue of the formula:



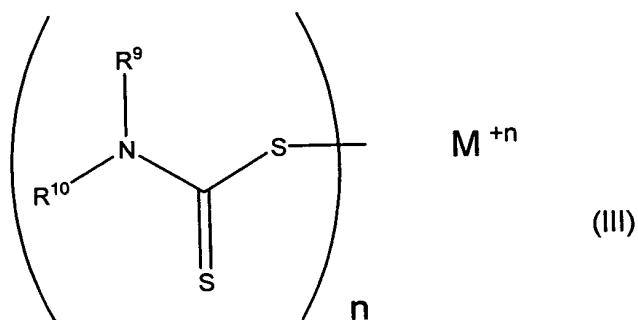
and R<sup>2</sup> and R<sup>3</sup> represent C<sub>1-22</sub>-alkyl and C<sub>5-7</sub>-cycloalkyl groups, R or R<sup>1</sup> and either R<sup>2</sup> or R<sup>3</sup> may be hydrogen,

(ii) bisdithiocarbamate compounds of the formula (II):

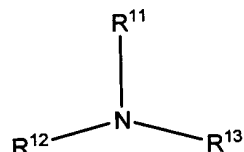


wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are aliphatic hydrocarbonyl groups having 1 to 13 carbon atoms and R<sup>8</sup> is an alkylene group having 1 to 8 carbon atoms,

(iii) dithiocarbamates of the formula (III):

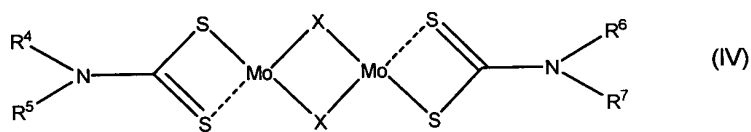


wherein  $\text{R}^9$  and  $\text{R}^{10}$  represent alkyl groups having 1 to 8 carbon atoms, M represents metals of the periodic groups IIA, IIIA, VA, VIA, IB, IIB, VIB, VIII and a salt moiety formed from an amine of the formula:



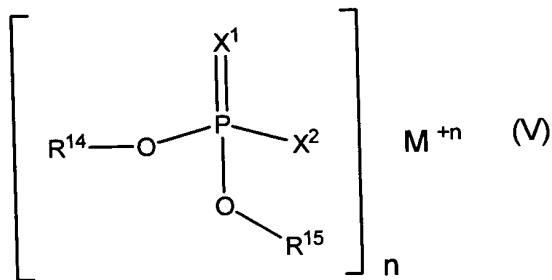
$\text{R}^{11}$ ,  $\text{R}^{12}$  and  $\text{R}^{13}$  being independently selected from hydrogen and aliphatic groups having 1 to 18 carbon atoms and n is the valence of M;

or the formula (IV):

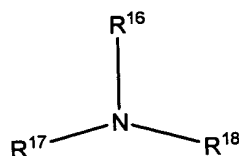


where  $\text{R}^4$ ,  $\text{R}^5$ ,  $\text{R}^6$ , and  $\text{R}^7$  are aliphatic hydrocarbyl groups having 1 to 13 carbon atoms and  $\text{R}^8$  is an alkylene group having 1 to 8 carbon atoms;

(iv) phosphorodithioates of the formula (V):

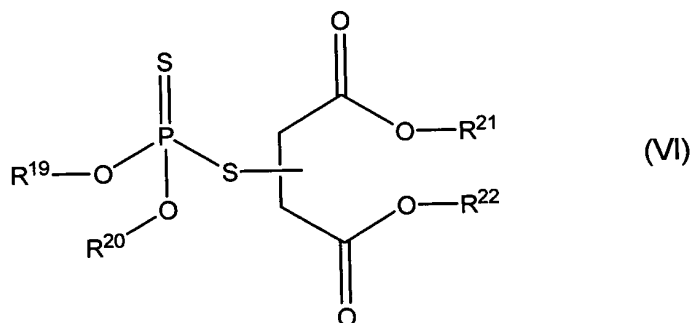


wherein  $X^1$  and  $X^2$  are independently selected from S and O,  $R^{14}$  and  $R^{15}$  represent hydrogen and alkyl groups having 1 to 22 carbon atoms, M represents metals of the periodic groups IIA, IIIA, VA, VIA, IB, IIB, VIB, VIII and a salt moiety formed from an amine of the formula:



$R^{11}$ ,  $R^{12}$  and  $R^{13}$  being independently selected from hydrogen and aliphatic groups having 1 to 18 carbon atoms and n is the valence of M; and

(v) phosphorodithioate esters of the formula (VI):

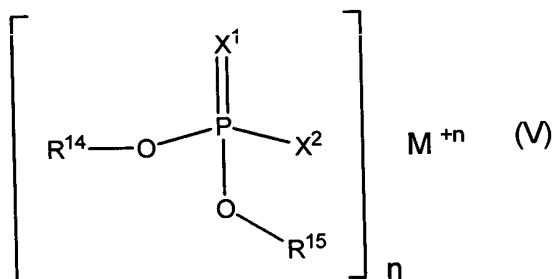


wherein  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ , and  $R^{22}$  may be the same or different and are selected from alkyl groups having 1 to 8 carbon atoms; and

(vi) a non-sulfur molybdenum additive prepared by reacting (a) about 1.0 mole of fatty oil having 12 or more carbon atoms, (b) about 1.0 to 2.5 moles diethanolamine and (c) a molybdenum source.

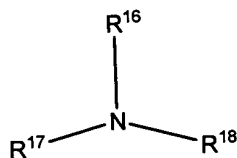
2. The composition of claim 1, wherein the borate ester composition is the reaction product formed by reacting about 1 mole fatty oil, about 1.0 to 2.5 moles diethanolamine followed by subsequent reaction with boric acid to yield about 0.1 to 3 percent boron by mass.
3. The composition of claim 2, wherein the borate ester composition comprises about 0.8-1.2 % boron.

4. The composition of claim 1, wherein the ratio of component (1) to component (2) is about 1:15 to about 15:1.
5. The composition of claim 4, wherein the ratio of component (1) to component (2) is about 1:9 to about 9:1.
6. The composition of claim 3, wherein component (2) comprises (iii) the dithiocarbamates.
7. The composition of claim 6, wherein the ratio is about 2:1 to 1:1.
8. The composition of claim 3, wherein component (2) comprises (ii) the bisdithiocarbamates.
9. The composition of claim 8, wherein the ratio is about 1:4 to 9:1.
10. The composition of claim 3, wherein component (2) comprises (iv) the phosphorodithioates.
11. The composition of claim 3, wherein component (2) comprises (v) phosphorodithioate esters.
12. The composition of claim 3, wherein component (2) comprises the non-sulfur molybdenum additive of (vi).
13. The composition of claim 12, wherein the ratio is about 1:1 to 3:1.
14. The composition of claim 3, wherein component (2) comprises (i) the thiadiazoles.
15. The composition of claim 14, wherein the ratio is about 3:7 to 9:1.
16. A lubricating composition comprising a major portion of an oil of lubricating viscosity and about 0.1 to about 10.0 percent by mass, based on the total mass of the lubricating composition, of the additive composition of claim 1.
17. The lubricating composition of claim 16, wherein component (2) of the additive composition comprises a phosphorodithioate of formula V



wherein  $\text{X}^1$  and  $\text{X}^2$  are independently selected from S and O,  $\text{R}^{14}$  and  $\text{R}^{15}$  represent hydrogen and alkyl groups having 1 to 22 carbon atoms, M represents metals of the

periodic groups IIA, IIIA, VA, VIA, IB, IIB, VIB, VIII and a salt moiety formed from an amine of the formula:



$\text{R}^{11}$ ,  $\text{R}^{12}$  and  $\text{R}^{13}$  being independently selected from hydrogen and aliphatic groups having 1 to 18 carbon atoms and  $n$  is the valence of  $\text{M}$ ,

wherein the phosphorus content is less than 0.05% by mass, based on the total mass of the lubricating composition.